ResearchGate

See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/335189201

PRINCIPLES OF PROJECT FINANCE

Presentation · August 2018

DOI: 10.13140/RG.2.2.14352.56325

CITATIONS
111

READS
9,483

1 author:

E R Yescombe
YCL Consulting Ltd
86 PUBLICATIONS **1,373** CITATIONS

SEE PROFILE

All content following this page was uploaded by E R Yescombe on 15 August 2019.

The user has requested enhancement of the downloaded file.

ESCOLA de CONTAS
TCMSP
Escola Superior de Gestão e Contas Públicas Conselheiro Eurípedes Sales

TRIBUNAL DE CONTAS DO MUNICÍPIO DE SÃO PAULO
1968-2018
50 ANOS
JUBILEU DE OURO

PRINCIPLES OF PROJECT FINANCE

E.R. (Ned) Yescombe
YCL Consulting Ltd., London U.K.
www.yescombe.com

PRINCIPLES OF PROJECT FINANCE

1) Introduction
2) Project contracts
3) Sources of project finance
4) Project finance in Brazil
5) Risk analysis & allocation
6) Financial structuring
7) Loan documentation
8) Conclusion

© YCL Consulting Ltd

1) INTRODUCTION

© YCL Consulting Ltd

WHAT IS PROJECT FINANCE?

- Project finance is a **specialised type of finance:**
  - Used for **high-cost assets** with **long construction / operation period**
    - × So **financing must be long-term** – typically 15+ years
  - Lenders mainly rely on **project contracts not physical assets** as security
    - × So need detailed analysis of project's contracts, risks and cash flow.
    - × 'Contract-based financial engineering'
  - Loan repayment only from **project cash flow**
    - × **Project must be 'ring-fenced'** (*i.e.* legally / economically self-contained).
    - ∴ Special-purpose vehicle ('SPV') '**project company'** as the borrower
    - × No guarantees from investors in project company (**'non-recourse'** finance)
  - **High ratio of debt to equity** – reduces blended cost of finance
  - **Finite project life**, so debt must be fully repaid
    - × *Cf*. corporate loan, where debt may be rolled over indefinitely

© YCL Consulting Ltd

WHERE DID PROJECT FINANCE COME FROM?

- Concept of lending against a cash flow, rather than value of an asset, not new
  - *e.g.* 18th-century turnpike roads in Britain
- Also developed in natural-resources projects:
  - oilfields: (Crédit Lyonnais in Russia *circa* 1900! → Texas 1920s/30s)
    → other natural resources projects
- Modern development:

1960s: medium-term corporate loans / property finance (from U.S. to Europe)
1970s: cash-flow based ship finance / tax leasing
1980s: U.S. power-purchase agreements (PPAs) / BOT contracts (Philippines, Chile, Turkey) / Lotus 123!
1990s: British power privatisation / PFI; mobile-phone networks
2000s: many countries face infrastructure deficit + budget restrictions
→ worldwide growth in PPI (private participation in infrastructure)

© YCL Consulting Ltd

INDUSTRIES USING PROJECT FINANCE

- **Natural resources**:
  - oil and gas / mining
- **Process plant**:
  - power generation, transmission & distribution (may also be PPP)
  - other utilities – water supply, sewerage, municipal waste (*ditto*)
  - pipelines (oil or gas) / LNG export and import plant, and LNG carriers
  - petrochemical plants / industrial processes, *e.g.* plastic bottles
- **Privatised / private-sector infrastructure**
  - railways, airports, ports (may also be PPP)
  - telecommunications (*e.g.* mobile phone networks / masts, satellite networks)
  - leisure projects (*e.g.* football stadium)
- **Public-private partnerships** ('PPPs') – private finance for public infrastructure
  - concessions – user paid, *e.g.* toll road
  - 'availability model' – government paid, *e.g.* social sector (schools, hospitals, *etc.*)

- **All involve major capital investments with a long-payback period**
- **Similar principles / structures whatever type of project**

© YCL Consulting Ltd

2) PROJECT CONTRACTS

© YCL Consulting Ltd

THE PROJECT CONTRACT

- The base on which the project-finance structure is built
  ∴ Need to understand how project contracts work

- Examples:
  - **Throughput contract**
    - e.g. electricity generation, electricity grid line, municipal waste incinerator, water supply / sewerage
    - may be PPP contract, or a contract between private-sector parties
  - **User-paid contract**
    - e.g. toll road, railway, port, airport, mobile-phone network
    - may be PPP contract (concession) or privatised/private sector project
  - **Government-paid ('availability-based') PPP contract**
    - typically social infrastructure, but also, *e.g.*, transport projects (as an alternative to concessions)

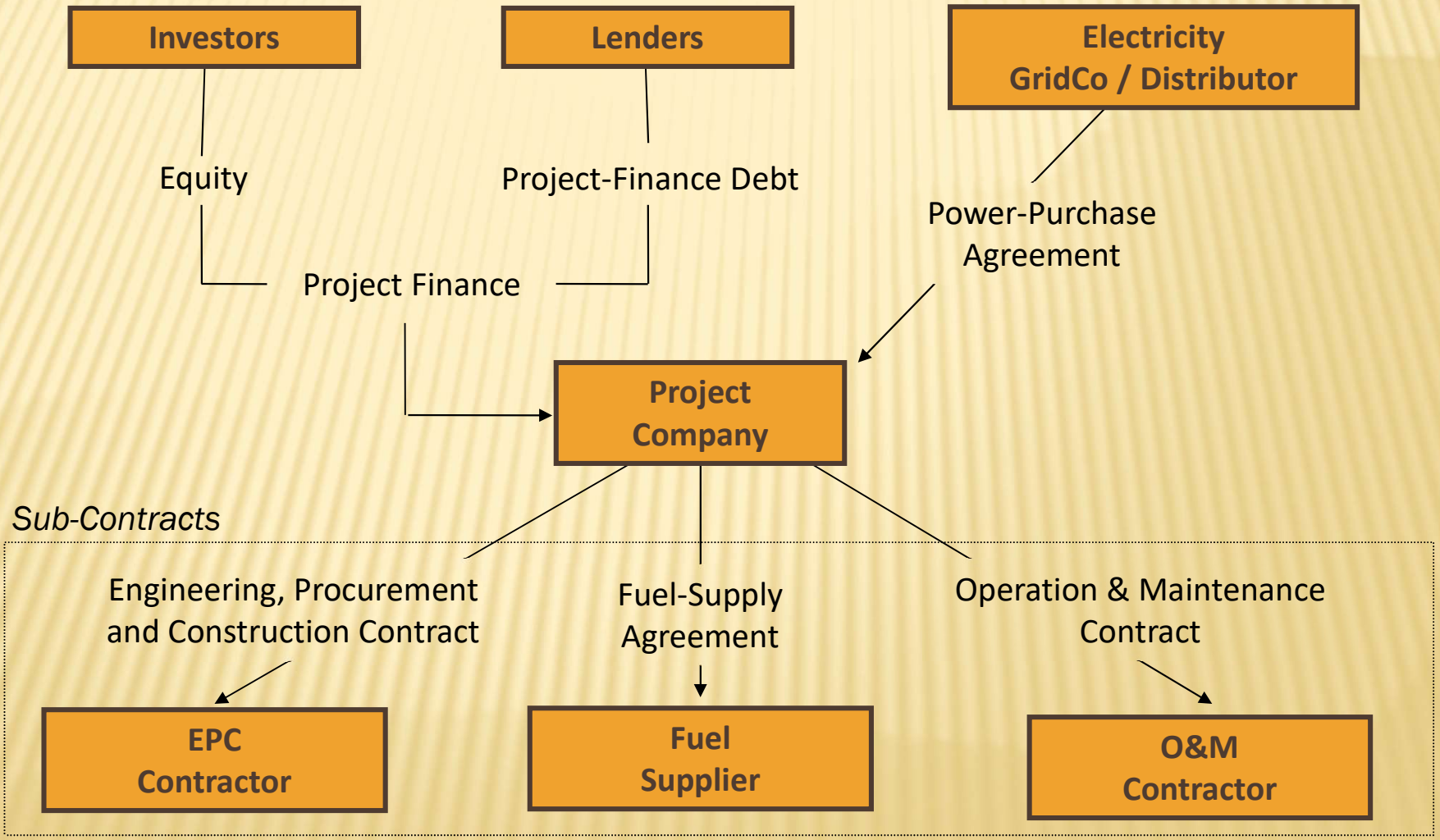
©YCL Consulting Ltd.

PROJECT CONTRACTS – KEY FEATURES

- Various names: power-purchase agreement, concession agreement, project agreement
- Parties: private-sector project company and *either* a public-sector party (= 'public authority') *or* another private-sector party
  - public authority = federal, state or municipal government, or other state entity
- Objectives:
  - Specify required performance (construction / operation)
    = 'output specification' - says what is to be built but not how to build it
  - Specify payment and performance régime
  - Allocate responsibilities and risks
  - Accommodate change
  - Penalise poor performance or failure, including termination arrangement
- Payment usually begins at end of construction phase, unless project relates to existing revenue-producing asset (*e.g.* water distribution, railway line)
- Contract payments calculated to:
  - repay bank loans or other debt
  - give investors an acceptable rate of return
  - cover projected long-term operating costs (allowing for inflation)
  - **so long as project performs as expected**

© YCL Consulting Ltd

POWER-PURCHASE AGREEMENT



POWER-PURCHASE AGREEMENT ('PPA')

- Offtake contract for an 'independent power project' ('IPP')
- Parties:
  - Private-sector project company
  - Public-sector grid / distribution monopoly (or could be private-sector distributor) = power purchaser
- PPA requires project company
  - to construct a power station with agreed technical characteristics, *e.g.*:
    - output (in megawatts [MW]);
    - heat rate (the amount of fuel required to produce a set amount of power);
    - conforming to emissions and other environmental requirements
  - to complete construction by an agreed date
  - to operate on an agreed basis
- Power generated sold on the basis of a long-term tariff
  - including penalties for failure to meet PPA requirements

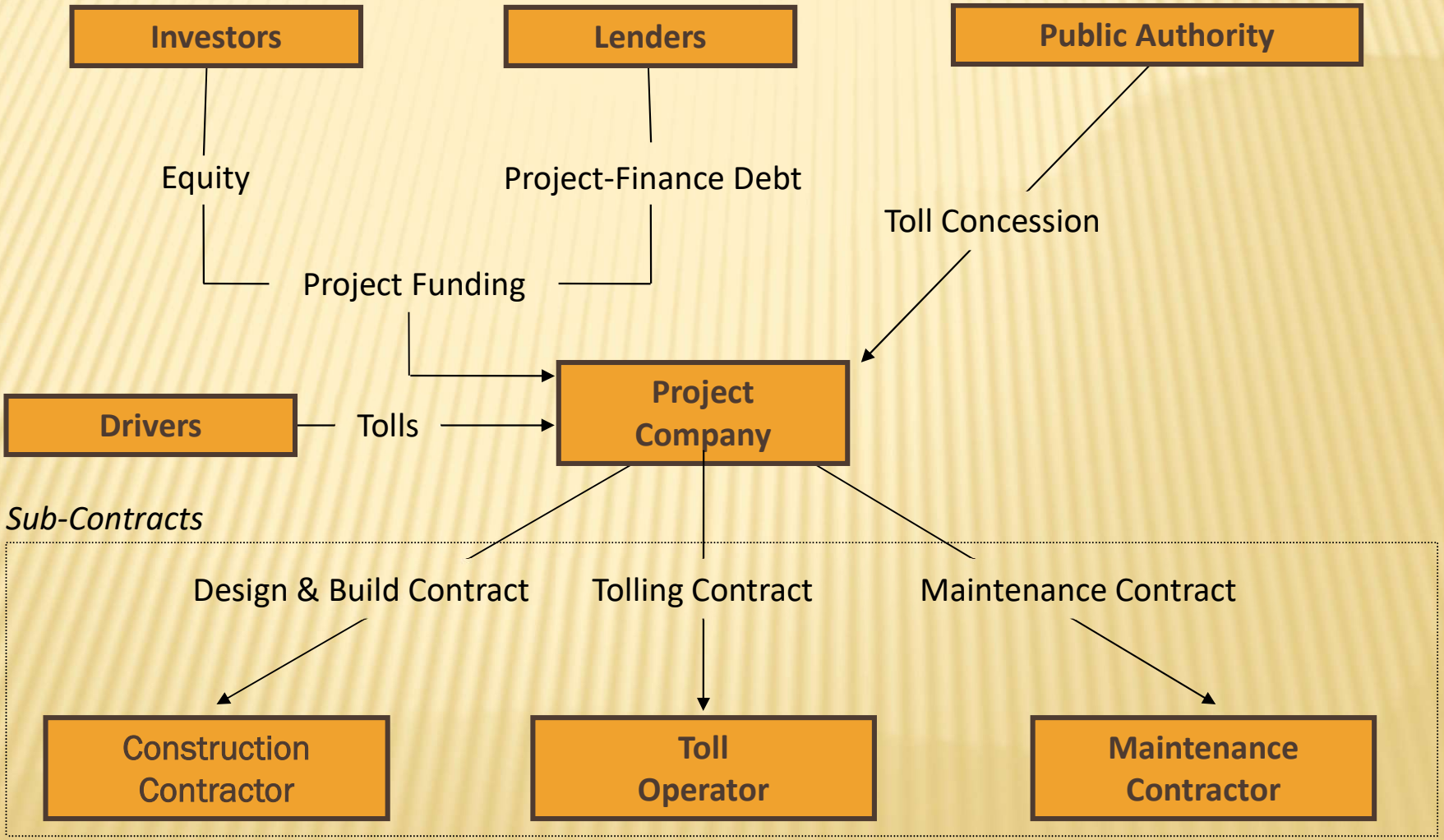
©YCL Consulting Ltd.

PPA TARIFF STRUCTURE

- **Capacity charge** (or availability charge) – fixed payment to cover:
  - assumed fixed (non-marginal) operating costs, *e.g.*:
    - land rental, personnel and administration costs, insurance premiums
    - scheduled maintenance and replacement of spare parts
    - payments to a fuel supplier
  - debt service (= interest payments and principal repayments)
  - return on equity investment
  - Paid even if plant is not despatched (= despatch risk)
    - *provided* the plant is capable of producing *x* MW of power
- **Energy charge** – variable payment to cover
  - assumed quantity of fuel (*e.g.* gas) used, based on assumed efficiency
  - actual cost of fuel per unit
  - other variable operation & maintenance (O&M) costs
  - allowance for degradation between major maintenance dates
  - usually not payable if plant is not despatched (unless fuel 'take-or-pay' obligation)
- **Other costs**: *e.g.* extra start-ups leading to higher maintenance

©YCL Consulting Ltd.

PPP: TOLL-ROAD CONCESSION



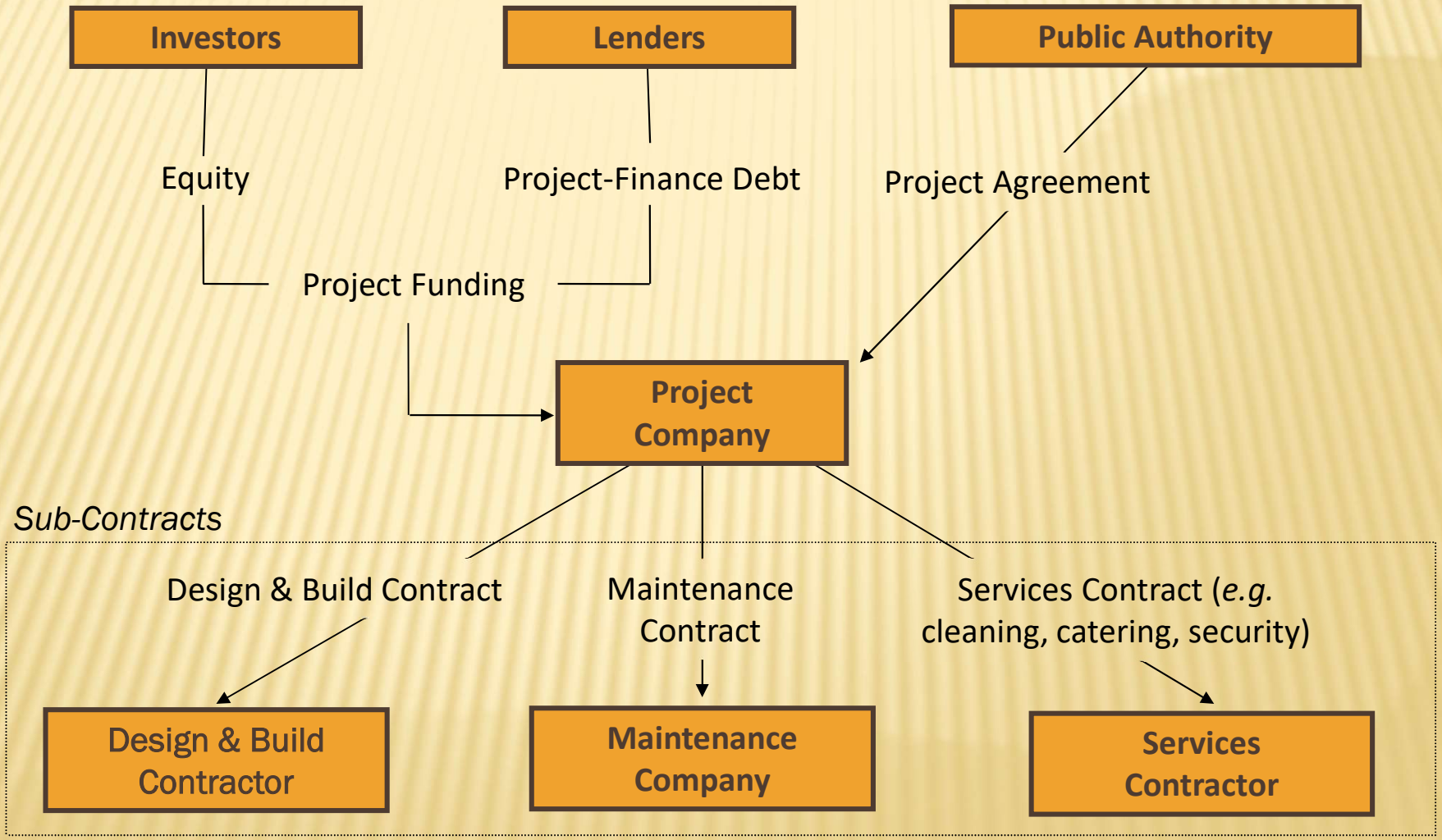
© YCL Consulting Ltd

TOLL-ROAD CONCESSION – TYPICAL TERMS

- Road concessions revived in 1990s by Australia & Chile
- Key concession terms:
  - Project company designs, builds (or upgrades), finances and operates road ('DBFO')
  - Public authority responsible for making land available, and connecting roads
  - Construction & maintenance must meet national standards
  - Right to levy tolls once work on relevant section of road is complete
  - Initial toll rates usually set out in concession agreement, with inflation indexation
  - Performance standards (*e.g.* time to clear the road of flooding, or after an accident), and penalties payable to public authority if they are not met
  - Concessionaire may be required to:
    - take on government debt used to build the original road, or
    - pay a concession fee to public authority, or
    - share excess revenues/profits with public authority (if traffic over projections)
  - Provisions relating to enforcement – rôles of traffic police and courts
  - Obligations to build further lanes if traffic increases
  - Hand-back condition of road at end of concession

© YCL Consulting Ltd

PPP: AVAILABILITY-MODEL PPP CONTRACT



AVAILABILITY-MODEL CONTRACT

- Britain began concessions in 1980s
  - Channel Tunnel, major road bridges
- Limited scope, especially as tolled roads did not exist
- Another model was needed for large-scale renewal of public building and other facilities
- **PFI model** (= 'private finance initiative'): type of PPP developed in Britain in the 1990s, uses similar structure to PPA:
  - ***Public authority* makes payments** so long as project is **'available'**
  - Performance standards (for maintenance and services) – deductions for poor performance
- Mainly for social infrastructure (*e.g.* schools, hospitals, prisons) or government offices
  - But also used for transportation sector, *e.g.* in Britain, United States

©YCL Consulting Ltd.

3) SOURCES OF PROJECT FINANCE

© YCL Consulting Ltd

EQUITY AND DEBT

- Project finance has two main components – equity and debt

- **Equity**, provided by **investors**:
  - 10-30% of project capital costs ('capex')
  - high risk / high return
    = high return on investment if project does well
    low return (or loss) if it does badly
  - 'upside' and 'downside'

- **Project-finance debt**, provided by **lenders**
  - 70-90% of capex
  - low risk / fixed return
    = paid before equity
    fixed margin over cost of funds
  - no 'upside' only 'downside'

© YCL Consulting Ltd

INVESTORS

- Initial investors in a project known as sponsor**s**
  = active project developers who will run the project if successfully bid / developed
- Typical investors:
  - **Sub-contractors**:
    - Construction contractors / equipment suppliers
    - Industry investors (*e.g.* power-generation company, toll-road operator)
    - Operation / maintenance contractors
  - **Financial investors**:
    - Pension funds & life-insurance companies ('institutional investors')
    - Infrastructure-investment funds, set up by banks, other financial institutions (including insurance companies) or specialist infrastructure fund managers
    - Development-finance institutions ('DFIs') – direct or *via* investment funds
    - Sovereign-wealth funds
- **Public authority** may also be an investor in a PPP:
  - to reduce net cost of project by offsetting share of income (but risks are different)
  - to share in any windfall gains
  - to ensure that is fully informed on project

  … But possible conflict of interest

© YCL Consulting Ltd

LENDERS

- **Banks**
  - Private-sector commercial banks prepared to make long-term loans to projects;
  - Main suppliers of debt in project-finance market (80-90% of total PF lending worldwide)
  - Mixture of major international banks with project-finance specialisation and banks with local expertise
- **Bonds** (also known as debentures)
  - Public / semi-public / private debt issue, or direct loan by non-bank lender
  - Usually bought by investors looking for long-term secure cash flow, *e.g.* insurance companies, pension funds
  - May be traded in financial markets, or private placements (not traded)
- **Non-bank lenders -** mainly insurance companies
  - Better control / greater flexibility than bonds; less risk than equity investment
  - May lend alongside banks
- Development finance institutions ('**DFIs'**) – multilateral, bilateral, national (BNDES)
- Export-credit agencies ('**ECAs'**) – where project imports equipment
- **Infrastructure debt funds** - invest mainly in equity, but some debt

© YCL Consulting Ltd

COMMERCIAL BANK PF LOANS (SECTORS)

(US$ millions)	2013	2014	2015	2016	2017	Mid-year 2018
Power	69,380	83,534	106,338	111,097	122,813	55,514
Infrastructure	57,611	62,165	79,468	48,525	53,404	22,803
Natural Resources	55,936	96,075	78,247	62,855	43,731	22,656
Other	21,100	17,951	13,162	8,679	9,690	3,218
Total	**204,027**	**259,725**	**277,215**	**231,156**	**229,638**	**104,190**

Source: *Project Finance International* League Tables

- *N.B.*:
  - Figures relate to private-sector commercial banks (and some non-bank lenders)
  - Figures depend on self-reporting, probably incomplete
  - Includes refinancings
  - Totals vary from those of other data sources (*e.g.* Thompson Reuters Dealogic) because of different classifications of what is and is not project finance
  - Not total investment in projects: equity and DFI / ECA finance excluded

© YCL Consulting Ltd

COMMERCIAL BANK PF LOANS (GEOGRAPHICAL)

($ millions)	2013	2014	2015	2016	2017	Mid year 2018
Americas	**51,420**	**92,884**	**93,277**	**55,902**	**64,431**	**33,589**
of which: USA	*31,403*	*60,158*	*56,535*	*33,843*	*42,506*	*23,793*
Brazil	***3,278***	***9,482***	***9,437***	***1,282***	***2,092***	***2,004***
Canada	*6,308*	*9,298*	*8,901*	*4,872*	*7,466*	*960*
Mexico	*2,335*	*4,687*	*7,911*	*4,089*	*4,986*	*1,987*
Asia-Pacific	63,646	72,226	76,263	51,942	80,381	33,355
Europe / FSU	52,395	64,780	69,095	86,936	55,192	25,838
Middle East / N. Africa	25,534	22,063	28,713	30,957	17,855	8,558
Sub-Saharan Africa	11,032	8,244	10,382	5,419	11,779	2,851
Total	**204,027**	**259,725**	**277,730**	**231,157**	**229,639**	**104,191**

- *Source: Project Finance International – Annual Surveys*

© YCL Consulting Ltd

PROJECT-FINANCE BONDS (GEOGRAPHICAL)

($ millions)	2013	2014	2015	2016	2017	Mid-year 2018
Americas	**26,563**	**24,807**	**19,253**	**22,402**	**32,328**	**14,671**
of which: USA	*13,506*	*12,306*	*10,880*	*13,653*	*18,866*	*4,811*
Brazil	***3,452***	***1,489***	***109***	***511***	***81***	***2,109***
Canada	*2,064*	*3,315*	*4,913*	*3,679*	*3,827*	*1,546*
Mexico	*3,874*	*3,027*	*0*	*2,716*	*4,654*	*1,164*
Asia-Pacific	2,986	4,951	5,284	3,645	6,723	2,346
Europe / FSU	16,323	18,276	10,748	16,544	19,830	3,226
Middle East / N. Africa	3,272	1,998	0	306	4,908	933
Sub-Saharan Africa	111	300	0	0	0	0
	49,255	**50,332**	**35,285**	**42,896**	**63,789**	**21,176**

- *Source: Project Finance International – Annual Surveys*

- N.B. Figures for Brazil do not include privately-placed debentures

© YCL Consulting Ltd

DFIs / ECAs

- Development Finance Institutions:
  - Multilateral ('MDFI') – *e.g.* World Bank Group, Interamerican Development Bank
    - Key principles – 'additionality' + catalyst for other finance
  - Bilateral – *e.g.* Japan Bank for International Cooperation (JBIC), Korea Development Bank, China Development Bank
  - National – *e.g.* BNDES, one of the largest national development banks
- Export-Credit Agencies ('ECAs')
  - Support exports of equipment from relevant countries (also sometimes civil works)
  - Often work with their country's bilateral DFI
  - OECD *Arrangement on Officially Supported Export Credits* sets standard terms for ECA-supported finance (but not adhered to by some countries, *e.g.* China)
- Products:
  - Direct loans
  - Financial guarantees (to support private-sector bank loans or bonds)

  Political-risk guarantees – most DFIs and ECAs

© YCL Consulting Ltd

DFIs/ECAs: INTERNATIONAL PF BUSINESS

(US$ millions)		**2,016**	**2,017**	**Mid-year**
MDFI PF Loans & Guarantees to Developing Countries				**2018**
World Bank Group (World Bank / IFC / MIGA / IDA *et al.*		2,460	2,009	774
Inter-American Development Bank / IDB (IIC)		956	927	258
Asian Development Bank		813	355	328
European Bank for Reconstruction & Development		708	989	97
European Investment Bank		615	480	72
African Development Bank Group		20	384	
Others		290	573	115
	Total	**5,862**	**5,717**	**1,644**
Bilateral DFIs, ECAs, *etc.* - PF Loans & Guarantees to Developing Countries				
JBIC / Nexi / DBJ / JICA	Japan	5,011	11,350	1,593
China Eximbank / CDB / Sinosure	China		4,653	1,260
KEXIM / K-Sure / KDB	Korea	3,840	2,289	1,073
SACE	Italy	930	700	0
Coface / Proparco / AFD / BPI	France	819	610	334
CDC / UK Export Finance	Britain	1433	503	105
US Export-Import Bank / OPIC	USA	870	366	45
KfW / Hermes / DEG / UFK / FIM Green Growth	Germany	662	281	217
Others		596	362	963
	Total	**14,161**	**21,114**	**5,590**
Source: Project Finance International	**Grand Total**	**20,023**	**26,831**	**7,234**
	of which: provided to Brazil	***723***	***332***	***1,877***

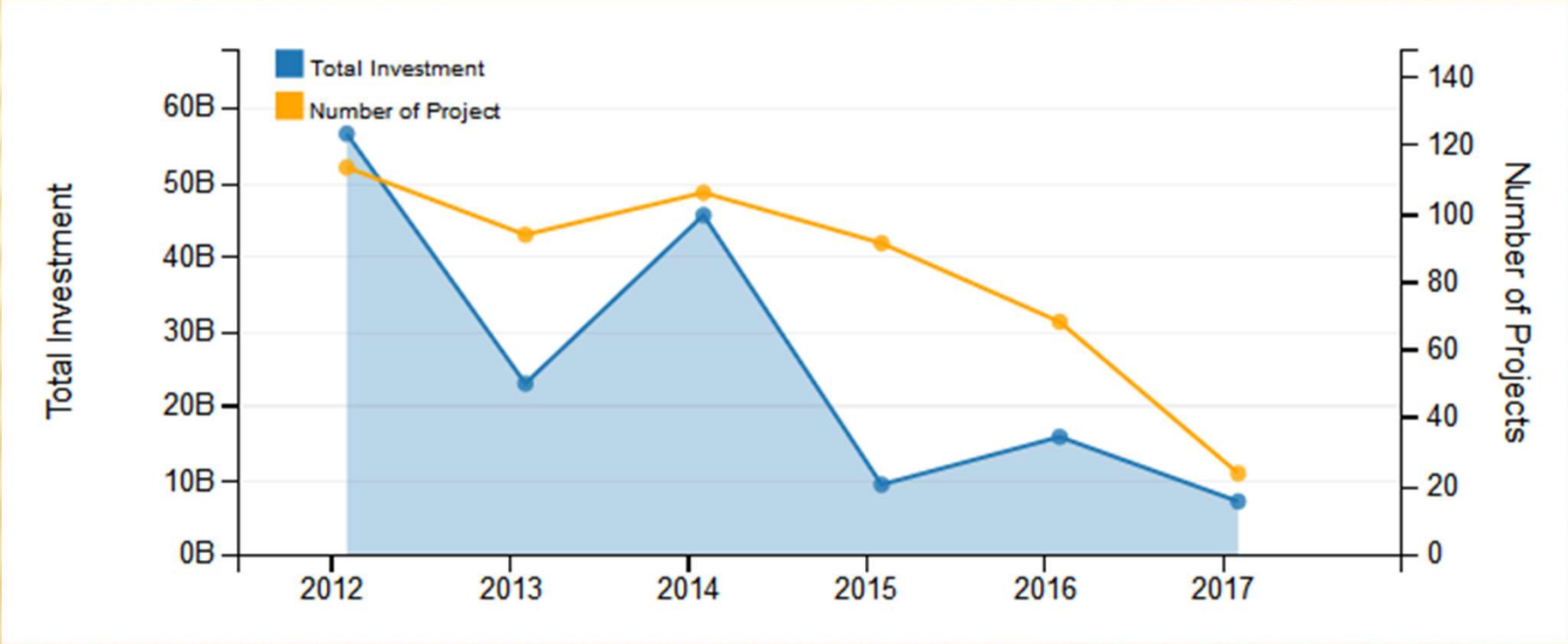
© YCL Consulting Ltd

4) PROJECT FINANCE IN BRAZIL

© YCL Consulting Ltd

PRIVATE PARTICIPATION IN INFRASTRUCTURE

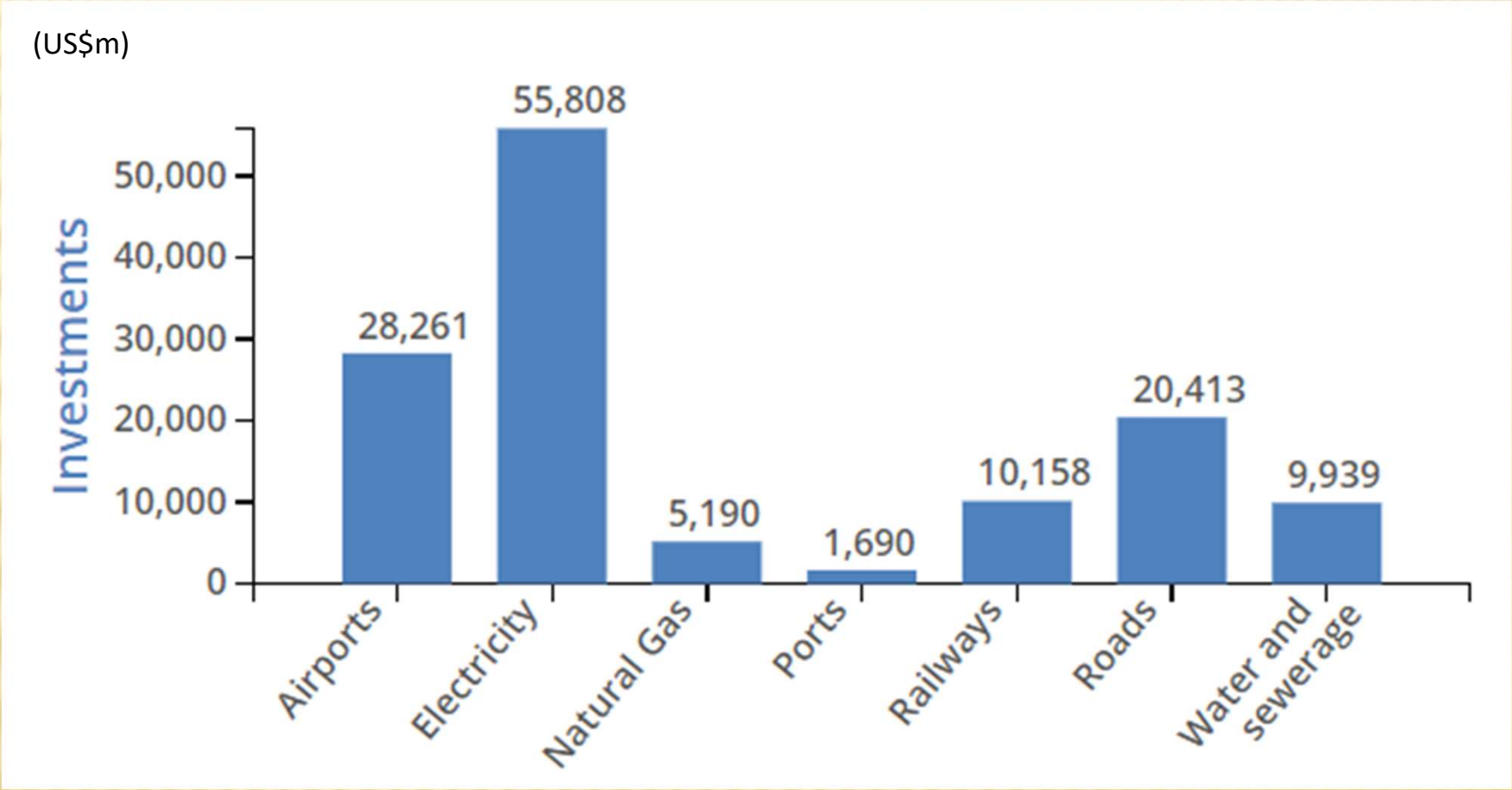
- Brazil PPI projects, 2012-2017
- N.B. Not just project finance – includes corporate finance. Social sector not included



Source: World Bank PPI Database

© YCL Consulting Ltd

BRAZIL PPI INVESTMENTS BY SECTOR 2012-17

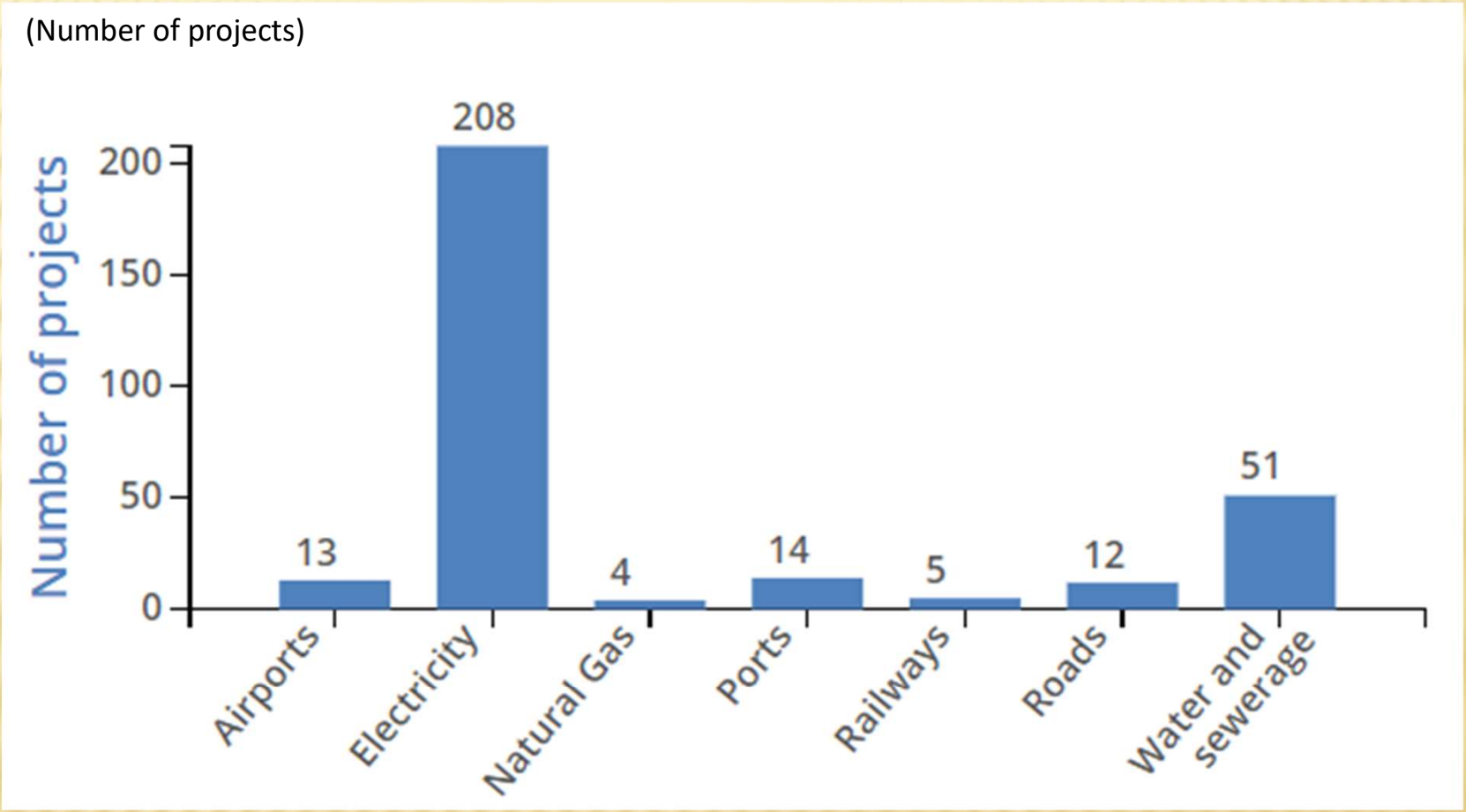


Source: World Bank PPI database

© YCL Consulting Ltd

BRAZIL PPI INVESTMENTS BY SECTOR 2012-17

(Number of projects)



Source: World Bank PPI database

© YCL Consulting Ltd

BRAZIL: TOP PPI SPONSORS, 2012-2017

Sponsor	Investment (USD million)	# of projects	
Odebrecht SA	26,454	22	Most sectors (incl. Mexico, Peru)
Construtora Queiroz Galvao	24,049	13	Most sectors
Invepar	17,769	6	Airports, railways, roads
J. Malucelli Construtora de Obras LTDA	15,628	5	Electricity, road
Companhia Vale do Rio Doce SA (CVRD)	6,984	15	Electricity, ports, railways
Brookfield Asset Management Inc	6,119	10	Electricity, natural gas
Construtora Triunfo LTDA	6,118	4	Airport, roads
Companhia de Concessoes Rodoviarias (CCR)	5,881	4	Airport, railway, roads
Iberdrola SA	5,850	19	Electricity
China Three Gorges Corporation	4,811	8	Electricity

Source: World Bank PPI database

© YCL Consulting Ltd

BRAZILIAN PPP MARKET

- Little effort to attract international investors to the PPP sector
  - Low rates of return
  - Contractor-driven market
    - Rate of return probably improved by high construction pricing
  - Tenders / documentation in Portuguese
  - Short tender period
- Major international infrastructure investors / funds not active in Brazil
  - Limited competition
  - No benefit from best international practice

- Social-sector PPPs seem to be quite limited

© YCL Consulting Ltd

THE RÔLE OF BNDES

- Has financed 70-80% of Brazil's infrastructure over the last 10 years, based on:
  - Low subsidised interest rate (TJLP)
  - Long-term debt maturities
- Other factors affecting private-sector project finance:
  - High return on low-risk government bonds (making infrastructure unattractive)
  - High short-term market rate (SELIC) discouraged long-term lending
  - Circular dependency: projects assumed TJLP cost so not viable on commercial basis
  - Private sector unwilling to join loans where most of the finance is by BNDES
  - Tax benefits on infrastructure bonds not enough to counterbalance these factors
- Current changes in BNDES approach:
  - TJLP being phased out over 5 years from 2018
    - Lending to be based on 5-year inflation-linked government-bond yield
  - BNDES to move towards an 'additionality' approach like other DFIs
    - Aims to act as a catalyst to bring in more private-sector project finance
- Lower inflation → lower SELIC rate

∴ Private-sector PF loans / bonds likely to play a larger part in infrastructure finance

© YCL Consulting Ltd

BANK PF LOANS – NON-BNDES

- **2017** – Primarily renewable power generation
  - Esperanza Transmissora de Energia (ING, Itau Unibanco; US$149m each)
  - Omega Energia e Implantacao (ABN Amro, Arab Banking Corp, Banco Bradesco, BNP Paribas, ING, Itau Unibanco, Santander; US$528m each)
  - Tiangua Wind Farm Power Plant (Banco Bradesco, ING, Santander US$57m each)
  - Ventos de Santo Estevao (Banco Bradesco, Santander; US$87m each)
  - Xique Xique 2 Wind Farm Power (ABN Amro, ING, Itau Unibanco, Santander, Shinhan Financial, SMBC; US$37.5m each)
- **1st half 2018**
  - Sepia Floating Production, Storage and Offloading (FPSO) – chartered to Petrobras (ABN Amro, Mizuho, MUFG, Santander, SMBC, Société Générale, OCBC; US$141m each)
  - Apodi Solar Complex (ABN Amro, Banco Bradesco, BNP Paribas, ING, Santander; US$25.6m each)
  - QMC Telecom Towers (ING US$150m)
- N.B. Other Brazilian banks may be participating in these loans through syndication

© YCL Consulting Ltd

PF BONDS - UNDERWRITERS (BRAZIL)

- **2017** – Renewable power generation
  - Santa Vitoria do Palmar Energias Renovaveis (SMBC US$10m)
  - Xique Xique 2 Wind Farm Power (Banco do Brasil; ING, Itau Unibanco, RBS, Santander, SMBC; US$8m each)
  - Ventos de Santo Estevao (SMBC US$22.6m)

- **1st half 2018**
  - Centrais Elétricas de Sergipe (Goldman Sachs US$1,012m) – gas-fired power station
    - JV of Eletricidade do Brasil, Golar LNG (Norway) & US infrastructure fund
    - Bonds (in R$) guaranteed by the Swiss ECA (+ $488m MDFI finance)
    - First R$ bond placement mainly outside Brazil
  - Hidrovias do Brasil (Banco do Brasil, Bank of America Merrill Lynch, Itau Unibanco, Morgan Stanley, Santander; US$120m each) – water transportation
  - Rumo (Banco do Brasil, Banco Bradesco, Bank of America Merrill Lynch, Citibank, Santander; US$82.7m each) – railway operations

© YCL Consulting Ltd

5) RISK ANALYSIS AND ALLOCATION

© YCL Consulting Ltd

RISK ANALYSIS & ALLOCATION

- Introduction
- Pre-financial close
- Construction phase
- Operation phase
- Legal & political risks
- Macro-economic risks (interest rates, inflation and exchange rates)

© YCL Consulting Ltd

RISK ANALYSIS: INTRODUCTION

© YCL Consulting Ltd

RISK MATRIX

- Risk analysis (by all parties, *e.g*. in a PPP, public authority, investors and lenders): :
  - Identify all possible project risks (however remote)
  - Measure effect of these risks on project company's ability to service debt / equity
  - Consider risk mitigations in project structure: *e.g.* risks → sub-contractors, insurance
  - Consider whether residual risks are acceptable
- Identifying risks: 'risk matrix' sets out analysis in blocks, *e.g.*:
  - Before project begins (= 'financial close'):
    - Finance risk (can debt be raised when required, on expected terms?)
    - 'Reputation risks' (for lenders / investors):
      - environmental / social issues, corruption → public protests
    - Land acquisition and related issues
    - Contract mismatches / interface risks
  - Construction phase: can the project be completed on time, to budget / specification
  - Operation phase: revenue & operating/maintenance risks; handback / residual value
  - Political, legal & regulatory risks
  - Macro-economic risks (interest rates, inflation and exchange rates)

© YCL Consulting Ltd

LENDERS AND RISK

- Debt is cheaper than equity, so
  - High leverage (ratio of debt to equity) produces a lower total cost of funding, but
  - High leverage creates greater risk for the lender
- Lenders' return is limited – fixed margin over cost of funds
  - 'Downside but no upside' – so project risks must be limited
    - 'A banker is a man who lends you an umbrella when it's not raining.'
- Therefore, lenders are most conservative in assessing risks:
  - 'lowest common denominator'

  ∴ determine risk-allocation requirements for a project financing
- *N.B.*: Lenders concerned about low probability / high impact risks:
  - may require a disproportionate amount of negotiation / evaluation
- Equity investors have a similar view to lenders, but take a more commercial view
- DFIs may be willing to take on more risk than private-sector lenders, but analysis follows the same matrix approach.

© YCL Consulting Ltd

‘DUE DILIGENCE’ - GENERAL

- Lenders need to be sure that project is:
  - technically viable
  - can be built on time and on-budget
  - financially viable (enough cash flow to pay the loan back?)
  - legally viable (anything in the legal documentation to undermine this?)
  - not politically vulnerable (environmental issues? corruption?)
- Detailed **‘due diligence’** process
  - Examines all aspects of technical solution, and environmental effects
  - Legal, technical and financial reviews of project contracts (project contract, sub-contracts, implementation agreement) – may require changes
  - Creates or audits financial model
  - Likely to be very time-consuming, and adds considerably to costs
- Relies heavily on external advisers:
  - Legal, technical (may include power market), insurance, financial model auditor
  - Duplicates public authority’s / sponsors’ advisers
  - Costs eventually paid by public authority in PPPs (or sponsors on losing bids)
- Value to public authority/sponsors
  - Lenders want the project to succeed, so they are (in a way) on their side
  - ‘Fresh pair of eyes’ – third-party due diligence – gives reassurance

© YCL Consulting Ltd

DUE DILIGENCE: BONDS

- Bond investors not directly involved in due-diligence process
  - Carried out for them initially by **investment bank**, appointed as lead arranger to structure the deal (similar to a commercial bank)
  - Project structure, cash flow, risks, *etc*. then reviewed by a **credit-rating agency** (main international agencies for PF are Standard & Poor's, Moody's, Fitch)
    - Assigns credit rating (*e.g.* S&P: AAA → AA → A → BBB → BB → B → CCC *etc.*)
    - Evaluation criteria / attitude to risk basically the same as commercial banks
    - Continues to monitor project and may change the rating
- Investment bank places bonds with investors looking for the particular level of risk / return (lower the credit rating higher the return)
- **Bond trustee** holds security; **paying agent** pays and receives funds

© YCL Consulting Ltd

INSURANCE

- Key part of the risk-reduction security for all parties
- Insurance generally covers:
  - *force majeure* (‘act of God’)
  - consequences of human error, *e.g.* fire
- Key insurances:
  - Construction phase
    - Construction All Risks – physical loss
    - Advance Loss of Profits – consequential (financial) loss
    - Third-Party Liability – legal requirements
  - Operation phase
    - All Risks – physical loss
    - Business Interruption – consequential (financial) loss
    - Third-Party Liability – legal requirements
  - *N.B.* variety of different names

© YCL Consulting Ltd

RISK ANALYSIS: PRE-FINANCIAL CLOSE

© YCL Consulting Ltd

FINANCE RISKS

- Risk that finance for the project is not available; obviously not a lender risk, but:
  - No point in awarding project contract if no evidence that finance can be secured
  - Project contact may need to be renegotiated
    - If debt terms are not as expected project may not be financially viable
    - If risk allocation does not meet lender requirements
  - In the worst case whole project may collapse
- 'Financial close' = date on which all project and financing contracts have been signed, and all their conditions precedents met, so construction can begin
  - *Cf*. 'commercial close' – finance contracts not signed
  - Ideally everything required for financial close should be dealt with on same day

© YCL Consulting Ltd

CONTRACT MISMATCH / INTERFACE RISKS

- **Contract mismatch**: Need to ensure that project contract matches sub-contracts, *e.g.*:
  - differences between completion requirements under the construction sub-contract and the project contract (unless former are more strict);
  - fuel supply sub-contract on take-or-pay basis but PPA only pays for fuel actually used
  - inflation indexation of sub-contracts differs from project contract
  - timing differences between revenue receipts and debt payments
  - different definitions of *force majeure* in different contracts
- **Interface risk** = one project dependent on another, *e.g.*:
  - Rail track built by public authority
  - Parallel PPP contract relates to signalling, *etc*. and/or rolling stock
  - Who takes risk of delays in completion / delivery?
  - Lenders expect:
    - × public authority to compensate if it delays completion
    - × construction contractor liability for penalties to public authority
    - × but concern about disputes where one side blames / holds up the other

© YCL Consulting Ltd

LAND ACQUISITION & RELATED RISKS

- Lenders expect land-related risks to be taken by public authority or construction contractor, not left with project company:
  - Land acquisition
    - × Lenders will not lend if public authority has not acquired land required for project
  - Ground condition risk usually → construction contractor
    - × Risk of delay from finding archæology / fossils, or potentially contaminated land, mining, *etc*. may be taken by public authority
  - Permitting
    - × Again lenders will not lend if the necessary permits (*e.g.* for construction) are not in place
  - Connections to project (*e.g.* roads) → public authority

© YCL Consulting Ltd

RISK ANALYSIS: CONSTRUCTION PHASE

© YCL Consulting Ltd

CONSTRUCTION-PHASE RISKS

- Lenders want construction-phase risks stripped out of the project company
  ∴ mainly passed to construction contractor:
- **'Turnkey' contract** – responsible for both design and construction of complete project ∴ no interface risks, & covers ('wraps') sub-contracts
- **Fixed price** ∴ construction contractor covers cost overruns
- **Fixed completion date** ∴ liquidated damages ('LDs') for late completion
- **Performance requirements** (e.g. signalling system) ∴ failure to perform → LDs
- N.B.: Increased risk assumption → increased cost (typically about 20%)
- Construction Contractor not liable for LDs, *e.g.*
  - If land is not available on time and holds up construction
  - *Force majeure* (insured risks) / relief from LDs – match those for project contract
- N.B.: Institutional equity investors and bond lenders generally unwilling to take construction risks

© YCL Consulting Ltd

RISKS ON CONSTRUCTION CONTRACTOR

- Since construction contractor takes on large risks, must be capable of bearing them
- Lenders are concerned with:
  - Technical expertise; experience with contracts of this size / scale
  - Experience with this type of high-risk contract
  - Credit standing – *e.g.* is the contract too big?
  - Level of sub-contracting (relying too much on expertise of others?)
  - Is the price reasonable (not too high or too low)?
  - Position as a sponsor (if applicable): arm's-length arrangements?
  - How easily could construction contractor be replaced?
- Security for construction contractor's obligations
  - Payment retentions (say 10% of each stage payment)
  - Bank or insurance guarantee / bonding
  - But liability caps – say 30% for LDs, original contract price for termination

© YCL Consulting Ltd

INCOME DURING CONSTRUCTION

- Road project:
  - existing tolled road / bridge / tunnel transferred to project company
  - toll revenue used to subsidise construction
  - lower cost to users as less investment needed
  - risk is revenue below projections → shortfall in construction budget

    ∴ lenders take conservative view on projections

© YCL Consulting Ltd

RISK ANALYSIS: OPERATION PHASE

© YCL Consulting Ltd

REVENUE – THROUGHPUT / AVAILABILITY MODELS

- Revenue derived from payments by public authority or private-sector offtaker
  ∴ Investors / lenders take no risk on demand for / usage of project
- Main lender concern is payment (= credit) risk
  - Affordability for public authority, credit standing of private-sector offtaker
  - May be required to provide security (*e.g.* bank letter of credit for 6 months' payments)
- Performance risk (possible penalties for poor performance affecting revenue):
  - Lenders don't want penalties to be so high that destabilise project
- Residual usage risk remains:
  - Higher usage → higher maintenance

© YCL Consulting Ltd

REVENUE RISK – CONCESSIONS

- Traffic risk in a toll-road project raises basic risk-assessment issue:
  - **Should traffic (= toll revenue) risk be transferred to private sector?**
    - Issues with data collection
    - Long-term traffic projections notoriously unreliable
      - "Willingness to pay" / value of time saved – difficult to estimate
      - Public sector generally (and prudently) overestimates traffic
      - 'Winner's curse'
  - Traffic growth not under control of project company but a factor of:
    - General growth in the economy + local development
    - The local and national transport network

      ∴ project company will overprice for risk
  - Transferring traffic risk to private sector may also inhibit public-sector ability to manage the network as a whole (*e.g.* 'non-compete' obligations)
- Public authority support may be required
  - *e.g.* minimum traffic / revenue guarantee, debt guarantee.
- Similar issues for passenger rail project
- For utilities such as water /sewerage concession bill collections remain key risk

© YCL Consulting Ltd

OPERATION & MAINTENANCE RISKS

- Operation & maintenance may be done by project company (especially in water, power generation & rail sectors)
- But often covered by operation & maintenance (O&M) sub-contract
  - Lenders likely to prefer this if passes down risks from project company
- Key issue – how much risk can be passed on to O&M contractor, especially:
  - Unavailability
  - Cost of major maintenance / lifecycle renewal
- Risks assumed by O&M contractor have to be balanced against its fee income / profit
  - If annual profit is $1 million, unreasonable for potential penalties to be $100m
  - But depends also if linked to one of the sponsors
- Lenders require cash build-up in O&M reserve account [*t.b.d*] to meet future major maintenance costs

© YCL Consulting Ltd

INVESTMENT AFTER CONSTRUCTION PHASE

- PPP may require additional investment after initial construction phase
- Road project: 2 lanes → 3 when traffic reaches certain level
  - Difficult to arrange finance in advance, as no way of knowing:
    - when it will be needed
    - how much construction will cost
    - cost and structure (e.g. repayment term) of new finance
      - impossible / expensive to get prior commitment from initial lenders
    - whether existing lenders will cooperate
  - Lenders don't want project to default if no investment made
- Rail project: may involve investment in rolling stock rather than line / signalling
  - Investment over time, partly from external funding, partly from project cash flow
  - More difficult for public authority to control
  - Again lenders concerned about future unknown costs and cash flow
- Water / sewerage concession
  - Often involves initial investment from debt and equity, thereafter from cash flow
  - What happens if there are problems with billing / collection?
  - Lender concerns as above

© YCL Consulting Ltd

HANDBACK / RESIDUAL-VALUE RISK

- Relates mainly to PPP contract but can also apply in some throughput contracts
- PPP project generally reverts to public authority at end of PPP contract term
  - By then public authority has paid off full cost of project
- One risk for public authority is the hand-back condition of the site / assets:
  - Prior inspection and retention of payments as security for hand-back
  - Or right to make repairs and deduct from PPP Contract payments
- Another risk for the public authority is that project no longer needed
  - But situation is the same if public authority had built facility itself

©YCL Consulting Ltd.

RISK ANALYSIS: LEGAL & POLITICAL RISKS

© YCL Consulting Ltd

LEGAL RISK

- **Change in Law** = risk of changes in law or regulations which impose additional costs on the project company, or reduce its revenue.
  - In a PPP, public authority can't agree that government won't change the law.
  - Shouldn't the project company pay since this is just a cost of doing business?
- Distinction generally made between:
  - **Discriminatory Change in Law** – *i.e.* aimed specifically at the project, the project company, or PPP project companies alone (= political risk)
  - **Specific Change in Law** – relating to the particular sector only, *e.g.* water supply
    - Cost risks of both retained by public authority
  - **General Change in Law** – other changes affecting project costs
    - Risk may be divided between project company and public authority, *e.g.*:
      - Changes involving capex shared on a pre-agreed ratio
      - All other changes – *i.e.* opex, taxes – for project company

© YCL Consulting Ltd

POLITICAL RISKS

- PPP Contracts need strong political support – important that this is from government *and* opposition, so if there is a change of government, policy does not change
  - Government can always use power of the state to attack projects
- Foreign investors / lenders may want political-risk cover – provided by DFIs, ECAs
- Political risks originally defined as:
  - currency convertibility and transfer
  - expropriation of the project by the state
  - political violence
- Newer category of 'creeping expropriation'
- So typical political-risk insurance / guarantee also covers:
  - non-payment of contractual payment obligations (including termination payments).
  - government action or inaction with a material adverse impact on the project
  - frustration of arbitration (refusal to recognise award)
- Problem of distinguishing, say, non-payment because of a genuine commercial dispute from non-payment to put pressure on project company

© YCL Consulting Ltd

SUB-SOVEREIGN RISK

- Relevant where
  (1) The public authority is not the federal/central government
    - *E.g.* state, county / city / municipality, other public-sector entity, *e.g.* electricity distributor
  (2) The public authority has to make payments
    - Applies in throughput/availability projects, but also financial obligations under concessions
- Credit analysis needed:
  - Where does its funding come from?
  - Can it commit its budget in advance?
  - What happens if it runs out of budget?
- Is a federal/central government guarantee needed?
  - But likely to mean federal/central mean government will want to control project…
- MDFIs may provide sub-sovereign guarantee

© YCL Consulting Ltd

MACRO-ECONOMIC RISKS & HEDGING

© YCL Consulting Ltd

INTEREST-RATE RISK

- Commercial-bank deposits are short term, so loan interest rate is made up of a fixed profit margin plus a cost of funds based on market rates ('floating rate')
  - The LIBOR markets: main basis for international lending in US$, €, £, ¥ *etc.*
- Interest rate movements – where banks lend on LIBOR or similar base, and rate increases:
  - during construction → increased costs → construction budget deficit
  - during operation → reduced cash flow jeopardises debt service & equity return
- Needs to be hedged, *e.g.* through interest-rate swap
  - unless fixed-rate loan (usually the case with bonds and DFI/ECA loans)
  - or risk taken by public authority/offtaker through payment adjustments

© YCL Consulting Ltd

INFLATION RISK

- Should project contract payments be fully indexed for inflation?
  i.e. initial annual payment = 100
  inflation over year 1 = 10%
  ∴ payment for year 2 = 110
- But project costs may not all be subject to inflation:
  - Fixed costs: debt service and investors' return (typically around 60% of costs)
  - Costs affected by inflation: variable costs (O&M, fuel for power generation, *etc.*)
- But temptation for public authority to index 100% anyway → lower initial payments but:
  - **High inflation** (compared to original budget) produces more revenues to repay debt, so beneficial to investors
  - V*ice-versa* for **low inflation**, leaving less cash-flow cover for banks and lower return for investors.
  - In recent years low inflation is found in many countries (including Brazil)
- Inflation hedging
  - Lenders may hedge with inflation-indexed debt instead of fixed-rate
  - BNDES moving to loans based on government inflation-indexed bonds
- Still may be risk because of mismatch of inflation index
  - *e.g.* CPI may not be in line with construction-cost inflation

© YCL Consulting Ltd

FOREIGN CURRENCY RISKS

- International commercial banks and DFIs/ECAs will usually only lend in US$, €, £, *etc.*
- Possible solutions:
  - **Project contract payments and debt / investment in foreign currency**
    - OK for projects with foreign-currency revenues (*e.g.* ports, airports)
    - Obviously does not work for user payments (*e.g.* toll road, utilities)
  - **Project contract payments in local currency, adjusted for exchange rate-changes**
    - Still a problem as above
    - Risk of catastrophic change (*cf.* 1998 Asian crisis – effect in Indonesia)
  - **Long-term currency swap**: usually difficult / expensive
  - Various possible ways to cover US$ finance in Brazil:
    - Currency hedging from BNDES
    - Offset concession fees against exchange-rate movements
    - 'Dollarisation' of PPAs

© YCL Consulting Ltd

6) FINANCIAL STRUCTURING

© YCL Consulting Ltd

BASIC FINANCIAL ANALYSIS

© YCL Consulting Ltd

UNDERSTANDING FINANCIAL BASICS

- Project contracts depend on a number of financial calculations – getting these wrong in the contract drafting or the financial model may have serious consequences for a public authority
- Those involved in a PPP project (whether in a financial role or not) need a basic understanding of the elements of a project's financial model, and the calculations surrounding this
- But level of understanding is quite basic – not difficult to pick up enough to deal with the key issues
- 'Time value of money' at the heart of many financial-model calculations

© YCL Consulting Ltd

NET PRESENT VALUE ('NPV')

- Discounted Cash Flow ('DCF') calculation → NPV
- NPV assesses:
  - the choice between different investments
  - the value of a future cash flow (= value of a PPA project)
  - if projects pass a 'hurdle rate' of return or discount rate (= time value of money + risk premium)

Discount rate: 10%

Year	Discount Factor	Investment A		Investment B	
		Cash flow	NPV	Cash flow	NPV
0	1.000	-1,000	-1000	-1,000	-1000
1	1.100	340	309	200	182
2	1.210	305	252	235	194
3	1.331	270	203	270	203
4	1.464	235	161	305	208
5	1.611	200	124	340	211
Total		**350**	**49**	**350**	**-2**

$$\frac{C}{(1+i)^n}$$

$$\sum_n \frac{C^n}{(1+i)^n}$$

© YCL Consulting Ltd

INTERNAL RATE OF RETURN (IRR)

- Measures the return over a project's life
- IRR is the discount rate at which NPV = zero
  - *e.g.* to find the IRR of the two previous investments:

	Investment A			Investment B		
Year	Cash flow	Discount factor *	NPV	Cash flow	Discount factor *	NPV
0	-1,000	1.0000	-1,000	-1,000	1.0000	-1,000
1	340	1.1208	303	200	1.0994	182
2	305	1.2561	243	235	1.2087	194
3	270	1.4078	192	270	1.3288	203
4	235	1.5778	149	305	1.4609	209
5	200	1.7684	113	340	1.6061	212
Total	**350**		**0**	**350**		**0**
IRR	**12.08%**	* @ IRR rate		**9.94%**	* @ IRR rate	

- Higher IRR for Investment A - cash received quicker

© YCL Consulting Ltd

USES OF DCF / IRR CALCULATIONS IN PPPs

Development / bid phase

- Part of public authority's initial feasibility:
  - Does the project pass 'hurdle rate' EIRR/FIRR for public projects?
  - Can the project offer market return to private sector?
- Investors' equity IRR → required payments under project contract
- Debt-cover ratios → for calculating how much debt can be raised
- Bid evaluation → for calculating lowest NPV PPP contract payments

Construction / Operation phase

- Adjusting contract payments for changes in circumstances
- Compensation for default (by either side)

Portfolio

- Valuation of shareholding
- Purchase / sale of project company

© YCL Consulting Ltd

NPV & DIFFERENT-SIZED PROJECTS

- NPV is biased in favour of bigger projects:

	Investment C	Investment D
Original investment	-1,000	-2,000
Cash flow 1 year later	1,400	2,600
NPV @ 10%	**273**	**364**
IRR	**40%**	**30%**
Cost–benefit analysis		
NPV of benefits	1,273	2,364
NPV of costs	1,000	2,000
Cost–benefit ratio	**1.27**	**1.18**

- NPV suggests D is better, but:
  - Investment C: 1000 of investment produces 1400 of benefit
  - Investment D: 1000 more of investment produces only 1200 more of benefit (hence the lower IRR)
- **Cost/benefit ratio** takes account of the distortion caused by using only NPV

© YCL Consulting Ltd

IRR AND CASH-FLOW TIMING

Year	Investment E	Investment F	@ 15.0%
0	-1,000	-1,000	
1	0	298	522
2	0	298	454
3	0	298	395
4	0	298	343
5	2,011	298	298
Total	**1,011**	**492**	**2,011**
NPV	**249**	**131**	
IRR	**15.0%**	**15.0%**	

NPV discount rate: 10.0%

- Calculation depends on reinvestment at IRR rate, and so overvalues early cash, and *vice versa*
- N.B.: NPV assumes reinvestment at (lower) cost of capital

© YCL Consulting Ltd

MODIFIED IRR (MIRR)

- MIRR uses a realistic reinvestment rate:

Year	Investment E	Investment F	Reinvestment of Investment E @ 15.0%	Reinvestment of Investment E @ 10.0%	MIRR Calculation
0	-1,000	-1,000			-1,000
1	0	298	522	437	0
2	0	298	454	397	0
3	0	298	395	361	0
4	0	298	343	328	0
5	2,011	298	298	298	1,821
Total	**1,011**	**492**	**2,011**	**1,821**	**821**
NPV	**249**	**131**			
IRR	**15.0%**	**15.0%**			**= IRR of**
MIRR	**15.0%**	**12.7%**			**12.7%**

NPV discount rate: 10.0%

Cost of capital: 10.0% (= MIRR reinvestment rate)

© YCL Consulting Ltd

NPV/IRR AND DIFFERENT PROJECT LIVES

- NPV/IRR are biased in favour of shorter projects:

Year	Investment G	Investment J
0	-1,000	-1,000
1	200	145
2	200	145
3	200	145
4	200	145
5	200	145
6	200	145
7	200	145
8	200	145
9		145
10		145
11		145
12		145
13		145
14		145
15		145
Total	**600**	**1,180**
IRR	**11.8%**	**11.8%**
NPV*	**67**	**105**

*Discount rate = 10%

© YCL Consulting Ltd

STRUCTURING EQUITY & DEBT

© YCL Consulting Ltd

EQUITY PRICING

- Investors typically measure their return based on equity IRR
- Equity IRR return target based on:
  - Investors' cost of capital (weighted cost of equity and debt), or marginal cost
  - Additional return required for project risk, *e.g.*:
    - type of project
    - location
    - extent to which risks are hedged by project contracts or sub-contracts
    - extent to which the investment adds to / diminishes spread of risk in investor's portfolio
  - Market competition
  - Project viability – if cannot support high equity IRR no point aiming for this
- Big range in market equity IRR rates (8%-25%) depending on type of project and location

© YCL Consulting Ltd

EQUITY STRUCTURE

- **Equity IRR**
  - *Investment*: share capital
  - *Return*: dividends

- **Blended Equity IRR** – often the key measure rather than 'simple' equity IRR
  - *Investment*: share capital + shareholder subordinated debt
    - Subordinated debt for tax / accounting reasons
  - *Return*: dividends + subordinated debt principal & interest payments
    - Known as 'distributions'
  - Public-authority/lenders usually not concerned whether equity or subordinated debt

© YCL Consulting Ltd

TIMING OF EQUITY INVESTMENT

- Equity can be invested (during the construction phase):
  - Before debt drawdown
  - *Pro rata* with debt drawdown
  - After debt drawdown
- The later the investment the higher the IRR
- Lenders not concerned so long as there is a commitment to invest
  → 'Equity bridge' loan

© YCL Consulting Ltd

DEBT STRUCTURE

- Debt structure has to fit within overall project cash flow:
  - project-contract payments = operating costs + debt service + equity return
- Drawdown:
  - over construction period (interest capitalised) for banks
  - usually in one amount for bonds (interest still payable during construction period)
- ‘Grace period’
  - Period before repayments begin – usually estimated construction period + 6 months (so project company may have a problem if construction is delayed)
- Repayments
  - usually semi-annual instalments
  - annuity repayment not level repayment (but BNDES requires level payment?)
- However repayment structure may be affected by various factors:
  - cyclical maintenance
  - time lags in tax payments
  - effect of inflation
  - lender requirement for a debt ‘tail’

© YCL Consulting Ltd

DEBT TENOR

- Tenor (maturity) of financing limited by:
  - Project-contract tenor, less the debt 'tail'
  - Financial -market availability – private-sector banks affected by 'Basel' requirements
  - PPPs typically need 15-25 year debt to be viable / affordable

- What if lenders only prepared to finance 20-year project contract for, say, 10 years?
  - Repaying whole capital cost in that time not feasible
  - Large part of debt will have to be refinanced
    → Risks of interest-rate change and market illiquidity

- Brazilian commercial banks generally limit tenor to 5-10 years – can be fitted into structure in various ways
  - Combination of bank finance for shorter tenor and bond finance for longer tenor
  - Bond refinancing after project complete and operating as projected
  - Construction-finance guarantees for bonds
  - Joint debt structures with non-bank lenders (insurance companies)

© YCL Consulting Ltd

DEBT INTEREST-RATE PRICING

- Interest basis:
  - Market cost of funds against based on which an interest rate is quoted by lenders
  - Typically fixed or floating rate
    - Fixed rate for bonds, other non-bank lenders and DFIs
    - Floating rate, *e.g.* LIBOR, for most banks (hedged by interest-rate swap)
    - Or floating rate in local currency

- Interest margin:
  - Lenders' profit margin (assuming interest basis = cost of funds)
  - Large increases in margins internationally after 2008 (1% for low-risk project → 2.5%)
    - Margins have declined again since 2008, but not as low as pre-2008

- DFIs lend at same or lower cost than private-sector lenders

© YCL Consulting Ltd

OTHER DEBT COSTS

- **Arrangement fees**: payable to arranging bank(s); based on:
  - Size and complexity / time and work in structuring
  - Recovery of costs on failed deals
  - Internal lender targets
  - Proportion of fees allowed to other banks
  - Roughly speaking, arrangement fee = interest margin
- **Agency fee**
  - for continuing services of lead bank
- **Commitment fees**
  - Typically half the interest margin, paid on undrawn loan amounts
- **Capital / liquidity costs**
- **Withholding tax** on interest
- **Advisors' fees**: Lenders' advisors' fees (technical, legal, model audit, *etc*.) covered by project company (and so ultimately by public authority)
- Similar fees for **bond issues and other fixed-rate lenders**

© YCL Consulting Ltd

DEBT-SERVICE COVER RATIOS

- Corporate financial ratios (*e.g.* leverage, interest cover, liquidity) not relevant for a project financing
- Amount of debt which can be raised for a project is primarily a function of lenders' required **debt-service cover ratios** - *i.e.* pre-debt service cash flow ÷ debt service:

Debt Term	25	years
Interest Rate	6%	
Annual project cash flow (pre-debt service)	1,000	*p.a.*
Annual debt service cover ratio	**1.50**	**1.25**
Maximum annual debt service	667	800
Amount of debt which can be raised	**8,522**	**10,227**

- If project costs 12,000 and the lenders require a cover ratio of 1.50, the investors need to provide 3,478 of equity (12,000 – 8,522) = 29% equity
- If lenders reduce the cover ratio to 1.25 only 1,723 (12,000 – 10,227) of equity is required = 14% equity

© YCL Consulting Ltd

COVER RATIOS AND LEVERAGE / RETURNS

- Level of cover ratio required is a function of perceived project & country risk, *i.e.* certainty of cash flow: PPP ADSCR ≈ 1.3 for low risk, 2.0× for high risk
  - N.B. BNDES sets lower cover ratios than private sector (= greater risk on loan, and increases 'crowding out' of private sector)
- Once lender's cover-ratio requirements are met this 'freezes' the debt : equity ratio
- 'Debt sculpting' – to smooth out cash-flow irregularities, *e.g.* maintenance downtime – also carried out on model.
- There is a complex interplay (circularity) between:
  - cover ratios
  - leverage (debt:equity ratio)
  - investors' returns
  - cost of debt
  - the most competitive level of project contract payments

© YCL Consulting Ltd

OPTIMISATION

	Case 1 Max. Debt	↓	Case 2 Leverage	↓	Case 3 Cover Ratio	↓	Case 4 Interest
Project cost	1,000		1,000		1,000		1,000
Debt : equity ratio	90% : 10%		**80%** : 20%		89% : 11%		81% : 19%
Debt interest rate	6.0%		6.0%		6.0%		**5.5%**
Debt repayment term	25 years		25 years		25 years		25 years
Lenders' required ADSCR	1.50 : 1		1.50 : 1		**1.25** : 1		1.50 : 1
Investors' required Equity IRR	15.0%		15.0%		15.0%		15.0%
Annual Payments							
Debt service (annuity repayment)	70		62		69		60
Dividends to provide Equity IRR *	15		31		17		30
Payment to cover debt service + equity IRR **	**86**		**94**		**87**		**90**
Payment to satisfy ADSCR	**106**		**94**		**87**		**90**

* annuity over the term of the PPP contract

** net of amounts to cover operating costs

© YCL Consulting Ltd

SENSITIVITIES

- Lenders run a variety of financial-model sensitivities, to check that they can be repaid in adverse circumstances, *e.g.*:
  - construction delay (with no compensation from contractor)
  - construction-cost overrun (*ditto*)
  - failure to meet performance standards* (*ditto*)
  - reduced availability
  - increased O&M costs
  - increased cost / earlier timing for major maintenance
  - higher and lower inflation
  - higher interest rates
  - changes in currency-exchange rates
- Lenders also run 'combined downside case' including number of above factors at the same time
- Known as 'scenario analysis'

©YCL Consulting Ltd.

7) LOAN DOCUMENTATION

© YCL Consulting Ltd

LOAN CLAUSES

- Main loan provisions include clauses defining:

Borrower
Sponsors
Purpose of loan
Arrangers / lender(s)
Loan facilities and amounts
Eligible project costs
Tenor
Availability period
Repayment schedule
Arrangement fee
Commitment fee
Interest margin
Other loan costs
Agency fee
Advisers' costs
Debt cover-ratio requirements
Maximum debt:equity ratio
Interest-rate hedging requirement
Drawdown procedure
Project accounts / reserve accounts
Cash-flow cascade
Distribution lock-up / default ratios
Reporting requirements
Cancellation and prepayment
Conditions precedent
Representations and warranties
Covenants
Events of default
Waivers & amendments
Security
Governing law & jurisdiction

©YCL Consulting Ltd.

CONTROL OF CASH FLOW: PROJECT ACCOUNTS

- **Construction Phase**
  - Construction contract costs often paid directly by lenders, rather than advancing to project company who then pays construction contractor; payments certified by lender's engineer
  - Next largest cost is interest during construction
  - Balance of costs paid by lenders on a monthly basis against original budget
  - 'Drawstop' by lenders if, *inter alia,* remaining funding insufficient to complete project
- **Operation Phase**
  - Revenues paid into Revenue Account under joint control with lenders
  - Separate Reserve Accounts set up (pre- or post-completion of project?):
    - **Debt-service reserve account ('DSRA')**: the next 6-monthly debt-service instalment (unless investors guarantee this amount)
    - **Maintenance reserve account ('MRA')**: to accumulate funds for major maintenance costs
    - Other reserve accounts as felt necessary by lenders, *e.g.* change in law
  - N.B. BNDES does not require reserve accounts, although may offer a conditional liquidity loan (which probably can't be drawn just when it is needed…)

©YCL Consulting Ltd.

CASH-FLOW WATERFALL

- Cash-flow waterfall (or 'cascade') applies during operation phase:

  - **Cash In**: Operating revenues
  - **Cash Out**:
    - Operating costs
    - Additional capex
    - Interest and other finance costs
    - Loan repayments
    - Transfers to reserve accounts
    - Mandatory prepayments ('cash sweep'), if any

    = **Distributions**

- Distribution block ('lock-up')
  - N.B. BNDES does not require a lock-up → cash-flow leakage

- Default ratios

©YCL Consulting Ltd.

REPORTING REQUIREMENTS

- Lenders and their advisors monitor project very closely
- **Construction phase**:
  - Monthly drawdown requests have to be approved by lenders' engineer, who also provides regular reports on progress, based on reporting to him by project company
  - Lenders' engineer also:
    - attends site / progress meetings
    - certifies that payments are properly due
    - provides agent with data to decide if construction budget is still OK
    - certifies project meets output requirements on final completion
- **Operation Phase**
  - Monthly or quarterly management reports to agent and lender's engineer
  - Cash waterfall calculations semi-annually
  - Cash-flow projections, reviewed by lenders' advisers
  - Audited accounts
  - Any other information reasonably required

©YCL Consulting Ltd.

CANCELLATION & PREPAYMENT

- During construction phase project company can cancel the balance of undrawn funding, provided lenders are satisfied that enough funds remain to complete project
  - Motive for doing so would be to save commitment fees
  - N.B. Cannot be done for a bond, only loan

- During operation project company can always use cash available for distributions for prepaying part of debt, but:
  - Not usually in investors' interests to lose distributions
  - But may wish to prepay debt to deal with distribution block.

©YCL Consulting Ltd.

LEGAL 'BOILERPLATE'

- **Conditions precedent**:
  - All have to be fulfilled before financial close
    - = project company can start drawing from lenders
  - Relate *inter alia* to effectiveness of all project contracts
    - = circular requirement meaning that all have to be signed at same time
- **Representations and warranties**:
  - That information provided to lenders is correct and no omissions
- **Covenants**
  - Undertakings to do, or not to do, various things, *e.g.*:
    - Amend project contracts
    - Use finance for anything except the project, and no unrelated business
- Main purposes:
  - to ensure that the project is constructed and operated as agreed with the lenders;
  - to give lenders advance warning of any problems that might affect the project company; and
  - to protect the lenders' security.

©YCL Consulting Ltd.

EVENTS OF DEFAULT

- Events which allow lenders to terminate the finance, if they so decide, *e.g.*:
  - defaults in representations & warranties or covenants
  - any non-payment of debt service or other costs
  - cash flow below default cover ratio

- Lenders' decision making; can agree to:
  - **Waive** an Event of Default (on a one-off basis)
  - **Amend** the relevant part of the loan documentation so the default cannot occur
  - **Call a default and demand full repayment**

- If more than one lender, vote based on proportion of loan held
  - Smaller majorities required for waivers, larger for amendments
  - But payment default allows any lender to demand repayment

- N.B. BNDES requires cross-default to sponsors (even if project is OK)
  - Not usual in private-sector project finance

©YCL Consulting Ltd.

LENDERS' SECURITY

- Lenders don't expect to get their money back from foreclosing on project assets (even assuming they can do so – usually belong to public authority)
- Purpose of security is:
  - to ensure lenders are involved at early stage if project begins to go wrong;
  - to ensure 3rd parties (such as unsecured creditors) do not gain any prior or *pari passu* rights over the project assets;
  - to ensure project assets are not disposed of without the lenders' agreement;
  - to enable the lenders to 'encourage' cooperation by the project company if it gets into trouble—*i.e.* the lenders will be able to tell the project company what to do
- Lenders have several 'layers' of security:
  - Cash-flow controls, as already discussed
  - 'Direct agreement' with public authority / offtaker
    - gives lenders extra time to 'step in' and remedy a default
  - Mortgages / assignments of project contracts, bank accounts, *etc*.
  - Security over project company shares
    - quick way of taking control of project company

©YCL Consulting Ltd.

GOVERNING LAW AND JURISDICTION

- If project is entirely domestic, *i.e.* lenders are all from the same country as the project company then project and loan documentation subject to local law
- But if cross-border lenders are involved will usually want loan documentation to be under English or New York law and jurisdiction, and may want same for project contract and other key sub-contracts
- Security generally has to be under local law – can cause problems if project-finance style security is not envisaged in local legal system

©YCL Consulting Ltd.

RECOURSE TO SPONSORS

- Sponsors may decide that they are willing to cover some risks because this is more cost-effective, *e.g.*:
  - *Contingent equity commitment*: agree to provide standby equity to be drawn in specific circumstances
  - *Cost-overrun guarantee*: agree to fund construction-cost overruns (usually when there isn't a fixed-price, date-certain, turnkey construction contract)
  - *Completion guarantee*: Agree to inject extra equity if completion does not take place by an agreed date
  - *Performance guarantee*: Agree to fund debt-service deficit if project is not performing to an agreed level
  - *Claw-back guarantee*: Agree to pay back dividends *etc.* in specific circumstances
  - *Interest guarantee*: Guarantee that interest will be paid
  - *Deficiency guarantee*: Agree to make up any deficiency in debt service (effectively = financial guarantee)
  - *Shortfall guarantee*: Agree to repay any part of the loan not repaid after termination and realisation of security

©YCL Consulting Ltd.

8) CONCLUSION

© YCL Consulting Ltd

WHY INVESTORS USE PROJECT FINANCE

- Project finance is complex and slow
  ∴ expensive type of debt, with high up-front costs (advisers', lenders' fees, *etc.*)
- Benefits for investors:
  - Greater leverage, so
    - lower blended cost of finance
    - higher return on equity
    - more competitive cost
  - Increased borrowing capacity
  - Long-term debt finance
  - Risk limitation / spreading
  - Partners with different financial strengths and industry skills can work together
  - Tax benefits (deductibility of loan interest)
  - [Off-balance sheet]
- N.B.: not all PPPs use project finance
  - Alternative is **corporate finance** (usually with smaller projects)
    - Investors use own funds – or raise any additional finance needed
    - Lenders, if any, do not rely on project cash flow, but investor's credit

© YCL Consulting Ltd

BENEFIT OF PROJECT FINANCE FOR PPPs

- Project finance for PPPs is beneficial to the public sector:
  - Typically avoids immediate budget / borrowing constraints
    - × But distinguish between *finance* and *funding* – PPPs are not 'free money'
  - Long-term finance perhaps not otherwise available
  - Lower total funding cost ∴ cheaper projects
  - Increases investors' financial capacity ∴ more competition for projects
  - Capital at risk (not just contractors but also lenders)
  - Third-party due diligence – role of the lenders
  - Greater transparency:
    - × Enables public authority to assess and monitor project-specific data
  - Additional inward investment / skills transfer
  - Financial-market development

∴ **So public authority should ensure that project finance is available for PPPs by ensuring 'bankability'** (= appropriate balance of risks)

© YCL Consulting Ltd

WHAT DO LENDERS EXPECT?

- From sponsors:
  - expertise / track record
  - arm's length sub-contracting
  - reasonable equity investment
  - financial capacity (but not obligation) to support project in case of problems
  - long-term commitment
- From sub-contractors
  - experience in the sector
  - credit standing
  - appropriate penalties / liquidated damages / bonding
- From public sector (for PPPs):
  - adequate project preparation / appropriate risk transfer
  - political commitment / consensus (between governing party and opposition)
  - support for unbankable risks (guarantees)
- From the country (especially by foreign investors and lenders):
  - Stable and effective legal system, so that contracts can be enforced
  - Ability to obtain and transfer foreign currency

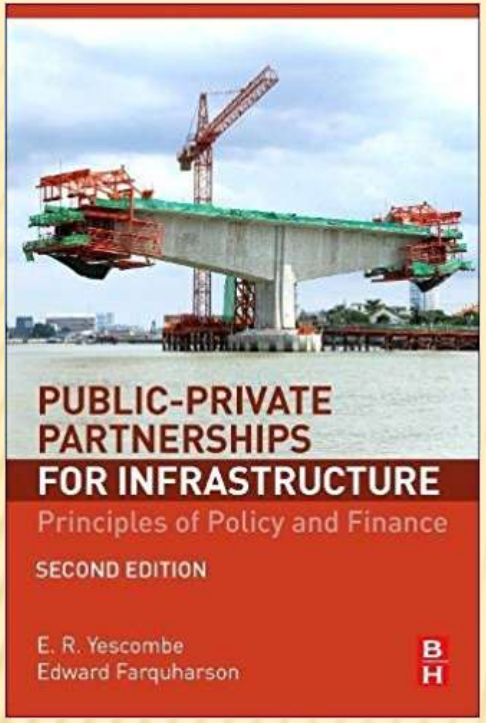
©YCL Consulting Ltd.

WHY DO PPP PROJECTS FAIL?

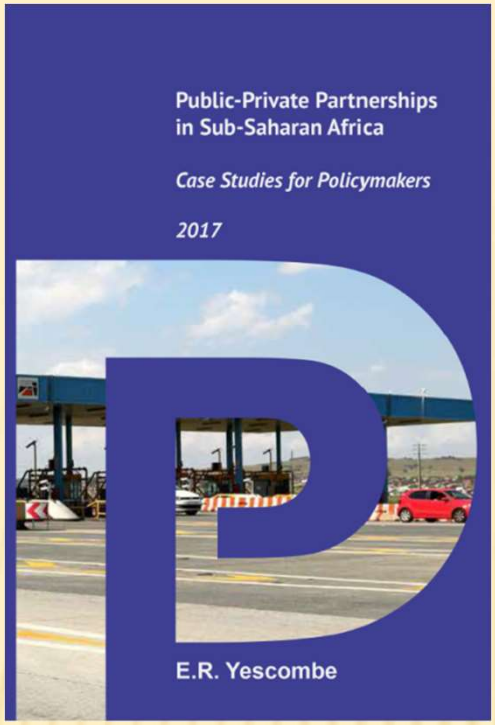
- Triggers for failure:
  - Inability to raise finance
  - Construction sub-contractor underestimating costs / relying too much on income from equity share / misunderstanding turnkey contract obligations
  - Underestimation of operating costs / over-estimation of revenues
  - 'Winner's curse' / contract renegotiation
  - Political interference

- Causes
  - Inexperienced public sector – poorly drafted contracts
  - Poor bid evaluation – cheapest bid may not be the best
    - Aggressive 'low ball' tendering, with the aim of renegotiation
  - Inexperienced investors – misunderstanding of what they are taking on
  - Government / opposition turning contract into political football

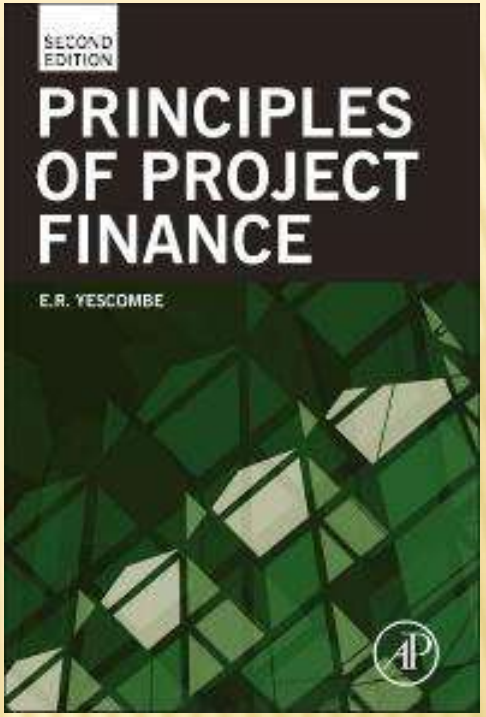
© YCL Consulting Ltd



Published 2018



Free download from
www.yescombe.com



Published 2014

Thank you for your participation!

You are welcome to email me at mail@yescombe.com
if you have any further questions